

ABSTRACT

The method of some embodiments of the invention assists a user in guiding a medical instrument to a subsurface target site in a patient. This method generates at least one intraoperative ultrasonic images. The method indicates a target site on the ultrasonic image(s). The method determines 3-D coordinates of the target site in a reference coordinate system. The method (1) tracks the position of the instrument in the reference coordinate system, (2) projects onto a display device a view field as seen from the position with respect to the tool in the reference coordinate system, and (3) projects onto the displayed view field indicia of the target site corresponding to the position. In some embodiments, the field of view is a view not only from the position of the instrument but also from a known orientation of the instrument in the reference coordinate system. By observing the indicia, the user can guide the instrument toward the target site by moving the instrument so that the indicia are placed or held in a given state in the displayed field of view.